In my comment on ET 02-135 filed earlier today, I asserted that the value of astronomy is not calculable and transcends purely economic considerations. That is not to say, however, that radio astronomy does not contribute to the economy. The examples below are taken from a section which I am preparing for a revision of the ITU Handbook on Radio Astronomy.

* Antenna metrology techniques developed for characterizing radio telescopes have applications for large communications and radar antennas.

* Radio astronomers developed antenas whose shapes remain parabolic even as they distort under variable gravity loading for different elevations.

* Very low noise receivers with system temperatures as low as 10 K and frequencies covering bands from a few MHz to 1000 GHz have been developed for radio telescopes. These have wide applications in radio technology.

* Astronomers played a significant role in refining the hydrogen maser clock, which is now widely used for space communications and in the defense sector.

* The VLBI reference frame based on extremely distant radio sources underlies the Global Positioning System.

* Phased array techniques developed for large aperture multi-element telescopes are also used in civilian and military radars, are used to locate cellular phones placing 911 calls, and will soon be extended to enhance the capacity of cellular telephone networks.

* Computerized x-ray tomography employs methods originally developed for mapping radio sources.

* The quest for understanding the evolotion of complex organic molecules in cold molecular clouds led to the serenditous discovery of fullerenes, creating a whole new area of chemistry and applications such as nanowires, as acknowledged by the Nobel award for chemisty in 1996.

* The study of the thermography of the body uses millimeter radio techniques. Similar techniques find vehicles in dusty and smokey battlefield conditions.

* Breast cancers can be detected at centimeter wavelengths (near 10 GHz) with modern radiometers.

* AIPS, the Astronomical Image Processing System developed at the National Radio Astronomy Observatory, is a software package for manipulation of multidimensional images that is used routinely in nonastronomical image analysis applications.

* The CLEAN algorithm is effective for artifact removal in image processing.

* Techniques pioneered by astronomers, such as "wavelet smoothing" and "maximum entropy," are used for pattern recognition.

* Fast Fourier transforms were greatly improved by radio astronomers.

* The programming language FORTH , which was developed at the NRAO 11-m telescope, is now used in many embedded systems and custom programming applications.